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# THE DEVELOPMENT OF MINIMALIST SYNTAX

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## Introduction

Many animals communicate with sounds and signs. Birds have elaborate songs to attract mates, some monkeys have special warning cries for different threats and some animals have even been taught to communicate with people using limited vocabularies of signed or spoken words. Each of these forms of communication represents some sort of paring between sound (or actions) and meaning. However, all of these forms of communication differ from human language in one very important feature, productivity. Not only can humans produce sounds that have abstract relations to meanings, but humans have a system of language that is both hierarchically organized and recursive, thus making it infinitely productive.

As the only species on earth with language in this sense, it seems logical to conclude that there must be some sort of biological basis for this property. Though the degree to which language is biologically specified has been argued for many years now, it has been generally agreed that there is something specific to humans that gives them the ability to produce language. This special property is known as the "Faculty of Language", and has long been the object of linguistic inquiry. By studying the Faculty of Language, linguists hope not only to be able to describe languages with all of their variation, but be able to explain the basic properties of language and how children are able to acquire it so easily despite the many factors working against them.

In the early 1960's, linguists were trying to explain language acquisition and linguistic variation with the "format framework", which relied on rules and constructions to explain grammar. It was assumed that children are born predisposed to acquire language through an innate "Universal Grammar". If children are born with a Universal

Grammar that specifies language, then for the format framework to be correct, those rules must be specified at some level within human minds. This explanation seemed too complex, and was significantly unlike other areas of learning and acquisition research.

By the early 1980's, linguists were building upon the earlier theories with a new framework, the Principles and Parameters framework, that sought to eliminate this reliance on rules and constructions in favor of a more generalized explanation of language acquisition. Instead of sets of rules in the Universal Grammar, this explanation was defined in terms of parameters that could be set on a finite array of principles. This vastly generalized the theorized process that children must go through in order to acquire language, and greatly simplified the complexity of the Universal Grammar. Perhaps the most widely known instance of the Principles and Parameters framework was Government and Binding theory, which was primarily concerned with abstract syntactic relations. The research conducted in Government and Binding yielded promising results, and was widely accepted. Though Government and Binding did not explain everything, it was viewed as "absolutely correct, in outline" (Hornstein 2005). However, there was still a problem; the system that Government and Binding described was still very complex.

In the early 1990's, the Minimalist Program was presented as a solution to this complexity. The Minimalist Program takes the assumption that language is a "perfect system" and that the Faculty of Language fits the constraints of this system in the most efficient way possible (Chomsky 1995:1). With this assumption, the Minimalist Program attempts to uncover how this optimal system is structured and what its underlying mechanisms are. Thus, the initial approach of the Minimalist Program has been to look at language independently from the human mind, in order to understand the logical

requirements it imposes. If the assumption that language is a perfect system is to be accepted, and that the Faculty of Language fits it perfectly, then the Universal Grammar can be examined as the interaction between these two assumptions, and the explanation that is yielded will be as simple as possible, i.e. minimal.

Efforts to frame language in such a way (as simply as possible) have long been a goal of language study. However, according to Noam Chomsky, these efforts have been hampered by important "conceptual barriers" (Chomsky 2005:9). In Chomsky's view, it was the Principles and Parameters approach that allowed a transition, by removing barriers of the "format framework" to allow the Minimalist Program (Chomsky 2005:8). However, this view may understate the development of the Minimalist Program; in fact it seems that the Minimalist Program is actually the most recent version of the Principles and Parameters framework. Here, I will track the development of the Minimalist Program from early generative grammar, through Principles and Parameters, to its current instantiation.

**A note about terms**

Several of the broad topics of this paper have subtly different meanings for different researchers. These terms mainly include "the Minimalist Program", "Government and Binding", "Principles and Parameters", "Faculty of Language" and "Articulatory-Perceptual and Sensory-Motor".

*Minimalist Program* will be used generally throughout this paper to refer to the research program started by Chomsky and others in the early 90's and the recent pursuits

in this research. It should be noted that the Minimalist Program is not considered a theory, or anything other than a research program.

*Government and Binding* will be used to refer to the theory of syntax in the Principles and Parameters tradition that focuses on the syntactic relations of government and binding. This is the same Government and Binding that is named for Chomsky's 1981 *Lectures on Government and Binding*.

*Principles and Parameters* refers to the framework of linguistics which suggests that all languages share a set of principles to which parameters can be set. Some (especially Chomsky) have argued that the Principles and Parameters approach and Government and Binding theory are synonymous terms. However, this paper will hold that these terms are distinct, and that the Minimalist Program is in fact another version of the Principles and Parameters approach, just as Government and Binding is its most popular version.

*Faculty of Language* is used here in the "broad" sense from Hauser, Chomsky and Fitch (2002:1570-1571). That is, the Faculty of Language "includes an internal computational system…combined with at least two other organism-internal systems…[the] 'sensory-motor' and 'conceptual-intentional'." The Faculty of Language is the system that allows humans to acquire "any human language without explicit instruction".

*Articulatory-Perceptual (AP) and Sensory-Motor (SM)* both refer to the same systems, that is the systems that allow for both the production and sensing of sound. When quoting different researchers, these terms may be interchanged.

**Plato's Problem**

It is commonly held that by some critical age, almost every child manages to acquire a language. Though this language matches the language of their environment, it seems that children acquire the language at a pace so rapid that simply stating that a child learns it from the environment would not explain how children are able to talk with near adult competence at such young ages.

Though it is clear that a child will end up speaking the language of his or her environment, it is not clear that there is actually enough good data in the child's environment for him or her to learn the language. Chomsky labeled this "Plato's Problem", and it is often known as the poverty of the stimulus argument. When acquiring language, children are exposed to data that contains errors, is not directed at them, doesn't include all possible grammatical constructions or is otherwise impoverished. However, children are still able to acquire the language of their environment, and improve over time; thus linguistic development is clearly somewhat reliant on both their cognitive development and the language they are exposed to. But, the speed and accuracy at which children acquire language suggests that acquisition cannot be limited to cognitive development and the environment.

It seems then, that children must have some sort of internal module for language acquisition. This internal module is the Faculty of Language, which must be innate in order to explain how children start acquiring language from birth, if not sooner[1]. Since it would make little sense to suspect that children are naturally predisposed to learn the language of their parents, and given what was known about biology and neuroscience, it

[1] Gomez and Gerken (2000:179) cite numerous studies that suggest language acquisition starts in utero. Such evidence includes a study showing newborns have a preference for their own mother's voice over other women's voices, and newborns show a preference for their own language over other languages.

seemed logical to conclude that this module was the same across all humans. This module is the Universal Grammar, described by Chomsky (1995:167) as, "the theory of languages and the expressions they generate". When a child acquires a specific language, the Universal Grammar has taken on a particular state. Modern syntactic inquiry aims to uncover both the structure of the Universal Grammar, and the properties that allow it to be set to particular states during language acquisition.

**Generative grammar**

The roots of modern syntactic study lay in generative grammar. Early generative grammar sought to explain two clear facts of language: almost all children are able to acquire language, and there is vast variation of languages in the world. This distinction is made quite clear with the terms "descriptive adequacy" and "explanatory adequacy". For descriptive adequacy, a theory should provide an explanation of an individual language's grammar. To be explanatorily adequate, a theory must be able to explain the "initial state of the language faculty" and how exposure to language allows a child to acquire it (Chomsky 1995:19). The idea of Universal Grammar was accepted as a potential solution to this dichotomy.

Clearly, the idea that children are innately predisposed to learn language helps in achieving explanatory adequacy, but it was not immediately clear how Universal Grammar was structured in the brain and how it could lead to all of the different languages that exist. In the early generative framework, if Universal Grammar was to be the same for all humans, and explanatory adequacy maintained, languages (Japanese, Turkish, English, Lao, etc.) must be primarily "known in advance of experience"

(Chomsky 1995:4). Though, in order to maintain descriptive adequacy, explaining the vast variation in human languages, the theories of individual languages need to be varied and complex. These theories were based on observation from numerous languages, allowing the identification of general rules that were thought to be part of the Universal Grammar. By explaining Universal Grammar in terms of rules and constructions found across languages, explanatory and descriptive adequacy was upheld.

There were several properties noticed within language that appear to be unique among "biological systems". Chomsky places particular importance on "the property of discrete infinity". He states:

> A working hypothesis in generative grammar has been that languages are based on simple principles that interact to form often intricate structures, and that the language faculty is nonredundant, in that particular phenomena are not "overdetermined" by principles of language….Another recurrent theme has been the role of "principles of economy" in determining the computations and the [Linguistic Expressions] they generate (Chomsky 1995:168).

These observations provide guiding principles for not only the generative framework, but any theory that is to follow it.

The Extended Standard Theory developed by Chomsky and others in the 1970's was one of the more widely accepted forms of the early generative framework. Under the Extended Standard Theory, "each linguistic expression (SD) is a sequence of representations (Chomsky 1995:168)." There are typically thought to be at least four levels in this sequence, those being "deep structure" (DS), "surface structure" (SS), "phonetic form" (PF) and "logical form" (LF). Each of these levels are part of the computational system that allows language, and operate on lexical items (words and morphemes). Once an SD has been derived, it is then passed to the "performance

systems, providing information relevant to their functions" (Chomsky 1995:168). These performance systems are broken up into two primary parts; "articulatory-perceptual" (AP) and "conceptual-intentional" (CI). There are five cycles between these parts of the system described in Chomsky 2005:

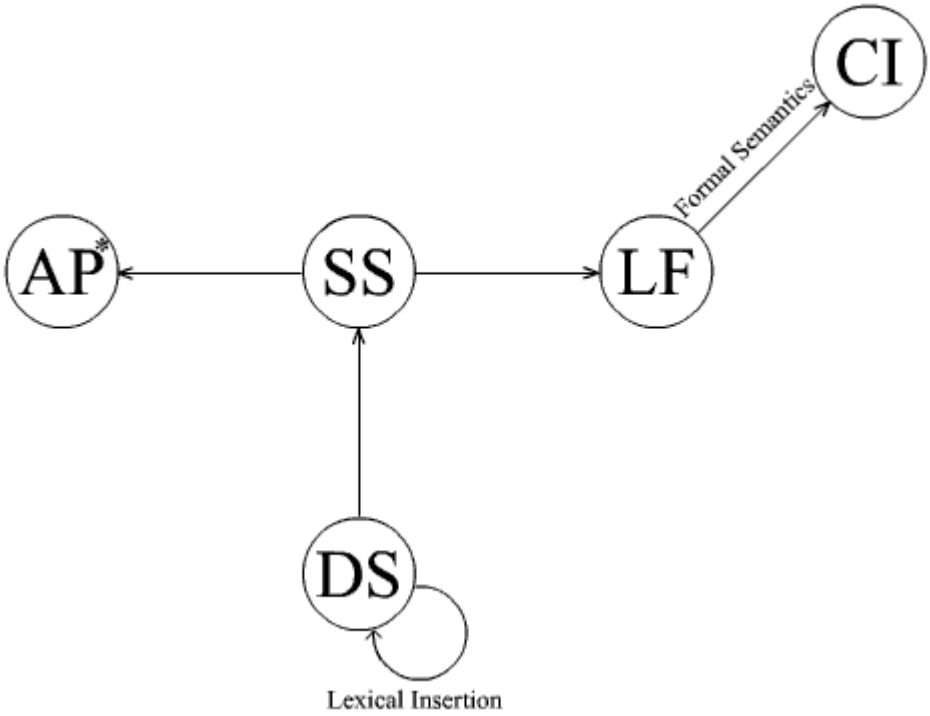


**Figure 1 The five cycles of Extended Standard Theory. *The AP overlaps with the PF in this model.**

**Principles and Parameters**

The Principles and Parameters approach built upon early generative grammar by adding explanations to the theory that could reduce the difficulty in achieving both explanatory and descriptive adequacy. Perhaps the greatest contribution to early generative grammar is that the Principles and Parameters approach does away with the concept that a grammar is made up of rules and "grammatical constructions of the traditional sort" (Chomsky 1995:6). Instead, the Principles and Parameters model says that language is composed of "universal principles" and a number of "parameters" that apply to those principles. As before, there is a computational system that uses a lexicon for its inputs to create linguistic expressions.

One of the results of such an approach is that the focus of study is shifted from individual languages to a broader array of linguistic properties. Rather than studying particular phenomena, the variations in languages should, "be reducible to the choices of parameters" (Chomsky 1995:6). Since the variation in languages is thought to be choices of parameters, the process of language acquisition is a matter of setting parameters to universal principles. Instead of taking an inventory of rules to explain the Universal Grammar, researchers sought to find crosslinguistic principles of language.

One of the earliest, most successful and most popular forms theories of the Principles and Parameters approach was Government and Binding theory which gets its name from Chomsky's 1981 *Lectures on Government and Binding*. As Hornstein (2001:2-3) points out, Government and Binding has "several distinctive features": 1) modularity; 2) a general transformational component; 3) the same four critical levels as Extended Standard Theory; and 4) government as a "central grammatical relation". These

features are important to understanding how Government and Binding gave rise to the Minimalist Program.

The modules of Government and Binding handle the various grammatical requirements of the theory. Each of the different relations, operations and features of the grammar has modules. These include: "modules for case, binding, phrase structure, movement, control, theta-structure, and trace identification (Hornstein 2001:2)." Each module is intended to handle a different component of the overall grammar. By using modules, Government and Binding eliminates the need for construction specific rules. Instead, the constructions that these rules previously formed come out of the interaction between the modules. This allows Government and Binding to be composed of relatively simple rules.

The "transformational component" of Government and Binding is composed of two main types of rules, movement rules and construal rules. Government and Binding uses a single simple rule for movement, called "Move Alpha" which, "allows any category to move anywhere at any time (Hornstein 2001:2)." The movement is then constrained by the modules of Government and Binding to avoid overgeneration. When a category is moved it leaves behind a trace, which is "a lexically empty XP of the same category in the position from which movement originates (Hornstein 2001:2)."

The "four critical levels" of Government and Binding are where linguistic expressions are generated, where transformations are applied and where the grammar interfaces with the CI and AP systems. These levels are the same levels as in Extended Standard Theory and have the same five cycles. LF and PF are known as "interface" levels, while DS and SS are known as "internal" levels (Hornstein 2001:3). While the LF

and PF interface with the sound and semantics of language, the DS and SS, "only interact with other parts of the language faculty (Hornstein 2001:3)." The DS is the interface with the lexicon, and the stage where recursion applies. The SS, on the other hand, is the point where the LF and PF split off from the derivation. Because both the PF and LF are dissociated here, their only relation is that they both come from the SS.

Finally, government plays a central role in the Government and Binding theory. Government defines the relations between elements in sentences. Government is an asymmetric structural relationship between sentential elements (i.e. one element may "govern" another) and can be found in all modules of Government and Binding theory.

> "Government lends conceptual unity to otherwise rather diverse components…. Though the modules 'worry' about different kinds of information and use different rules and locality domains they are nonetheless organized in terms of the same basic structural primitive (Hornstein 2001:3)."

Everything in Government and Binding theory is either restricted or defined in terms of government.

Hornstein 2001 does not place binding as one of the central "distinctive features" of Government and Binding. However, as Government and Binding's name suggests, it is an important part of the theory. Binding defines co-reference relationships between elements on the sentential level. In a sentence like, *John drove him to the store*, binding eliminates the interpretation that both *John* and *him* refer to the same person, but allows the expected interpretation. Binding theory has three main principles, which deal with the different types of possible relationships. Principle A deals with the binding relationships of anaphors (i.e. himself, herself, itself, etc.); principle B deals with the binding

relationships of pronouns (as in the example above); and principle C deals with the binding relationships of nouns that refer to entities (such as *John*) (Haegeman 1994) .

**Government and Binding into the Minimalist Program**

By the late eighties, the Government and Binding theory was perceived as a highly successful endeavor. The theory itself was seen as essentially perfect in general, "only lacking in detail" (Hornstein 2005). It was able to explain almost everything in the grammar, and provided the machinery for whatever explanations were missing. However, the theory had one major shortcoming. Though the system explained almost everything it needed to, it lacked simplicity. In line with Occam's razor, it was thought that if this theory could be simplified, it should not be considered absolutely correct. It was in this spirit that Chomsky and other researchers began asking the question of what the human language faculty looks like if we assume language is a "perfect system". This meant eliminating everything that was not conceptually necessary, including the elements that seemed necessary in earlier theories.

The hope was to use the Government and Binding as a measure for a new, simpler conception of language. Since it was nearly perfect, any other explanation of language should be able to explain what the Government and Binding theory did; the facts of Government and Binding should be the "output" of the Minimalist Program (Hornstein 2005). So, following the already well accepted Principles and Parameters approach (of which Government and Binding was the most popular instantiation) researchers began to enquire what the minimal parts of language must be. Hornstein argues that since the Principles and Parameters models are already perceived as solving the problems

surrounding the acquisition of language, it must be determined which version of the Principles and Parameters approach best fits criteria for "simplicity, elegance, parsimony, and naturalness (2001:4)."

The Minimalist Program used just this approach, and if it proves to be successful, it will eventually lead to a theory. The Minimalist Program assumes several facts about language, and "requires any theory of grammar to accommodate them (Hornstein 2001:4)." Hornstein (2001:4) presents the following facts:

> (i) sentences are the basic linguistic units, (ii) sentences are pairings of sounds and meaning, (iii) there is no upper bound to the number of sentences in any given [Natural Language], (iv) sentences show displacement properties in the sense that expressions are pronounced in one position are interpreted in another, and (v) sentences are composed of words organized into larger units with hierarchical structure, i.e. phrases.

In addition to these facts about language, the Minimalist Program takes into account "two types of economy considerations (Hornstein 2001:4)." The first of the two types is "methodological economy". This type of economy considers factors "such as simplicity and parsimony", and attempts to reduce the number of factors, modules and principles present in any given theory. The second type of economy is "substantive economy", which places a value on the available resources: derivations should be as computationally efficient as possible, "maximizing resources". (Hornstein 2001:5)

As stated before, a grammar must account for the fact that sentences are pairings of sound and meaning. This means that grammar must interface with both the "articulatory-phonetic" and "conceptual-intentional" systems. Government and Binding met these conditions by allowing the PF and LF (which are fed by the SS, which is in turn fed by the DS) to be the interface levels for these systems. In order to meet the criteria already imposed, the system of grammar that interfaces with both of these

systems must do so in the simplest way possible. This would mean reducing the number of cycles in the syntax, if possible, to a single cycle.

Another reduction might be possible in the transformational system. A single rule set would be preferred over the two rules (movement and construal) in Government and Binding. In the case of the Minimalist Program, movement is assumed to be the only transformation rule. While reducing movement to a single operation, traces as "grammatical formatives" would ideally be eliminated in the Minimalist Program "unless strong empirical reasons force this conclusion (Hornstein 2001:7)." In the Minimalist Program, it is suggested that traces are actually copies of the elements moved.

**The Minimalist Program**

As discussed before, the Minimalist Program makes three major assumptions about language: 1) there is a group of basic facts that language follows, 2) a theory of language must follow methodological economy considerations, and 3) a theory of language must follow substantive economy considerations. Given these assumptions, the Minimalist Program reduces language to the minimally necessary components.

Thus, one of the most striking differences between the Minimalist Program and previous Principles and Parameters approaches is the "distinctive levels" of grammar that the approach is assumed to have. Remember, in Government and Binding, language has four such levels, DS, SS, LF, and PF. Because language must minimally interface with the articulatory-phonetic and conceptual-intentional systems, of these four levels, the only two that are conceptually necessary are the LF and PF. DS and SS only interface with the grammar itself, while the PF interfaces with the AP and the LF interfaces with

the CI. Having only two levels is favorable for methodological economy considerations, and is therefore favored in the Minimalist Program. Only if strong empirical evidence for a SS and DS can be provided should they be accepted into a theory of language. A goal of the Minimalist Program will then be to demonstrate that the LF and PF are not only "conceptually necessary" but "also empirically sufficient" (Hornstein 2001:7-8)

To eliminate the DS and SS levels, it should be determined what their function was that made them seem necessary in earlier Principles and Parameters approaches. DS and SS played important roles in Government and Binding, but Chomsky and others realized that their functions could be eliminated on empirical grounds and replaced by other mechanisms such as feature checking.

However, by eliminating DS there is no longer a way to explain how lexical items are combined at all, not even considering how they are combined recursively. This was accounted for by the operation MERGE. The MERGE operation is used to join two syntactic elements (either lexical items or phrases). Varying theories exist on the actual restrictions of MERGE; Frampton and Gutmann (2000:1) point out two possibilities (favoring the second). The first proposal is that elements are freely allowed to combine and are only later filtered to determine if a derivation is grammatical. The second proposal is that generation of sentences is "highly constrained" thus deriving "well-formed and interpretable" elements from the start. This second proposal seems to be more inline with substantive economy since it would avoid the generation of ungrammatical sentences altogether as well as the need to filter them. Regardless of the proposal, combining syntactic elements through MERGE replaces the explanation that the DS is where lexical insertion happens.

Also, without SS and DS, traditional restrictions on transformations no longer exist. Ideally, only movement would exist, and this is the assumption that the Minimalist Program takes. In essence, movement in the Minimalist Program is an unrestricted operation, MOVE. MOVE can apply to any element at any time, but, rather than being restricted, movement is checked so elements that would crash a derivation never end up moving. Again, by eliminating the complexity in the system, substantive economy is supported.

Furthermore, without SS and DS it can be assumed that "the core grammar" is relatively simple, being comprised of only MERGE and MOVE. These two operations provide restrictions on all the necessary components when applied in different combinations. Because these are the only two operations, the same rules and restrictions can apply to them throughout the grammar. Yet again, the number of restrictions, rules, and modules is reduced, furthering methodological economy.

Thus, within the Minimalist view the Universal Grammar is "constituted of invariant principles with options restricted to functional elements and general properties of the lexicon (Chomsky 1995:170)." A language is then selections among these options, and language acquisition is the process of setting the options. Each grammatical derivation comes from a pairing of the LF and PF. In accordance with efficiency, all linguistic expressions are "optimal realizations of the interface conditions (Chomsky 1995:186)."

Note that this description of the Universal Grammar is not well distinguished from the fundamental idea of the Principles and Parameters approach. It is still founded on the idea that the Universal Grammar is specified as a set of principles and it can be set

with various parameters. Despite this, Chomsky does not present the Minimalist Program as part of the Principles and Parameters approach[2]. In fact, the similarity between these approaches suggests that the Minimalist Program is actually the most recent version of the Principles and Parameters framework.

**Recent Instantiations of the Minimalist Program**

Recently, the Minimalist Program has been recast in an evolutionary and biological framework by Chomsky. Though it has been an implicit assumption of Universal Grammar that language is a biological predisposition of humans, works such as Chomsky 1995 and Hornstein 2001 did not concentrate on the biological motivations of the Minimalist Program. However, Chomsky 2005 and Hauser, Chomsky and Fitch 2002 do this explicitly. As Chomsky 2005 states, this view is not a new line of inquiry within or without linguistics and has been around since at least the late 1960's.

Viewing language biologically brings about and interesting point about the evolution of humans and language. Chomsky (2005:3) addresses the evolutionally "fairly recent" development of language that seems to date back "a little over 50,000 years ago" when there was a clearly defined increase in human creativity. Citing Ian Tattersall, Chomsky attributes this to the development of language[3]. If the Minimalist Program can determine what the structure of language must be, then it would in turn show the changes

[2] In fact, this may be due to a choice in terms. As I noted before, Chomsky chooses to view both Principles and Parameters and Government and Binding as synonymous terms. If this is the case then it is clear that the Minimalist program would not be part of the Principles and Parameters approach (because it is clearly not a part of Government and Binding). However, this seems to be a minority view of Government and Binding and Principles and Parameters.

[3] This idea is popular among other researchers as well. In the PBS documentary "Journey of Man" (2003), anthropologist Richard Klein sees the development of language as directly coinciding with the burst in human creativity and abstract thinking, and argues that the two are necessarily linked. Also, the program's host, Spencer Wells, views the development of language as a major contributing factor in the mass migration of humans from Africa to the rest of the world.

that must have occurred in the human brain in order to allow for the development of human language. In fact, human language may actually just be a byproduct of this change, the change itself may well have been a new way to deal with elements in the mind (namely MERGE).

This view of language still drives Chomsky to ask what factors of language can be divorced from the human Faculty of Language all together. If language has properties autonomous from human thought, then (as before), the human Faculty of Language can be thought of as a system that exists by fitting these properties. Chomsky's view of the Faculty of Language is that it is a biological system, a module in the brain, and "more or less on a par with the systems of mammalian vision, insect navigation, and others (Chomsky 2005:2)." With this view, the module—the Faculty of Language—will acquire a state, this state will be the language of an individual. In doing this, Chomsky is trying to study language "as part of the natural world (Chomsky 2005:3)."

In this view, language is a module in the brain, and as children acquire language, this module takes on a state specific to the individual and his or her environment. The modular approach to learning says that as an organism learns, the modules, "change states under the triggering and shaping effects of external factors, more or less reflexively, and in accordance with internal design (Chomsky 2005:5)." Chomsky (2005:6) argues that if it is assumed that language is like "other biological systems" then there are "three factors" that should be sought to explain the development of language in individuals: 1) "Genetic endowment … which interprets part of the environment as linguistic experience;" 2) "Experience, which leads to variation, within a fairly narrow range;" and 3) "Principles not specific to the Faculty of Language." The third factor may

include “principles of data analysis” and “principles of structural architecture and developmental constraints… including principles of efficient computation.” These factors are used to argue that the inclusion of MERGE in the human mind may have been the evolutionary step in human development that is responsible for the human Faculty of Language.

**Conclusion**

There is no doubt that many animals communicate, but it would seem that only humans have infinitely recursive and thus highly productive language. The system that allows this difference between animal communication and human language has been identified as the Faculty of Language, and it is this that allows humans to acquire and use language as we do. Because humans are the only living things on earth that have developed a truly productive means of communication, there can be no doubt that the Faculty of Language is somehow innately specified. Ultimately, understanding of this faculty has been the goal of grammatical study for the past half century (or more) and philosophical inquiry for much longer than that.

The idea of a Universal Grammar was a major breakthrough in understanding the Faculty of Language. With Universal Grammar, there was a way to explain how nearly all people are able to acquire language, regardless of background, and yet still explain how languages varied so much. In fact, Universal Grammar suggests that despite the variation in different languages, there are some qualities that are shared. However, any theory that deals with Universal Grammar needs to say what it specifies, and how it exists in the mind. Early theories attempted to explain this with sets of rules and constructions

found in languages. This, however, ended up being an inventory of various languages, and was so complex it seemed as though it would be unable to fully explain both how children acquire language and the variation found in language.

Theories like these persisted into the 1980s, but the Principles and Parameters framework provided a new look at the structure of the Universal Grammar. Rather than relying on an overly complex system of rules and constructions, the Principles and Parameters approach relied on a less highly articulated system. The Universal Grammar was characterized as a set of basic principles that all languages follow and specific languages emerged as those principles took on various parameters. Government and Binding was the most successful theory within the Principles and Parameters framework, and was viewed by many scholars as highly successful. However, the theory itself still relied on a number of complex ideas most of which only seemed conceptually necessary.

The Minimalist Program was adopted by Chomsky and others with the explicit goal of explaining the Faculty of Language using only what could be proven as conceptually necessary. It is Chomsky's view that it was the Principles and Parameters approach that allowed the Minimalist Program to emerge, by removing "conceptual barriers" in the explanation of the Faculty of Language. Yet the Principles and Parameters approach did more than this; it provided the foundation for the Minimalist Program. Language was viewed as a "perfect system", and the Faculty of Language implemented this system in the most efficient way possible. Emphasis was placed on reducing computational complexity; only the computationally efficient explanations were allowed in the program. Anything that added to the complexity would need to be proven

as absolutely necessary to the theory. In this way, the Minimalist Program reduced language to the simplest possible explanations.

The early efforts in the Minimalist Program divorced explanations of language from biological factors. Though ultimately the goal would be to explain the Faculty of Language, the Minimalist Program was first to explain language on its own. Then, with explanations for this perfect system in place, researchers could begin explaining how that system arose in humans. This explanation would still utilize the idea of principles and parameters specifying language, but language was specified in advance of them. Chomsky's recent work suggests that the Minimalist Program might be much more than this. It appears that Chomsky believes the Minimalist Program will give way to the theory that finally explains all of human language, from the evolutionary advances that gave humans the ability to use language in the first place, to the diversity of languages found today. Though some "biolinguistic" view of language may one day be able to explain both the origins of language alongside acquisition and language description (in fact it seems logical that it would), it seems a bit early to include the Minimalist Program in this view.

Regardless, the Minimalist Program has proven to be a successful research endeavor. Not yet a theory, the program has started to provide explanations of language that are satisfying from the perspective of computational efficiency, which is highly useful when trying to develop principled explanations. However, there also seems to be a lack of explanation as to why the goal of computational efficiency should be thought of as the simplest solution to the problem (Frampton and Gutmann 2002). Without definitive proof that this is the best approach possible, the Minimalist Program may

remain only an attractive solution to a difficult problem. Despite this, the Minimalist Program has certainly developed out of many years of careful linguistic inquiry, and will undoubtedly prove to be a useful research endeavor, even if it does not lead to the ultimate explanation of human language.

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